



POLITÉCNICA



E.T.S. DE INGENIERÍA AGRONÓMICA,
ALIMENTARIA Y DE BIOSISTEMAS

Título de las prácticas (Title of the internship):

Data analysis in Computational Biology

Descripción de las funciones del alumno (Description of the student's tasks)

The student will join the Scientific Computing Service of CNB-CSIC, where they will develop -in cooperation with experimental groups- data analysis tasks applied to experimental results, and models to interpret them. The specific tasks will depend on the moment of incorporation and the interests of the student.

Currently, we are working on a project to analyze the adaptation mechanisms to the infection by IBDV. IBDV is a dsRNA virus causing a major poultry disease of high impact in avian farms. Preliminary analysis shows that resistance to infection may be linked to defective viral genomes (DVGs). The goal is to characterize these genomes and the cell response using RNAseq. We currently finishing previous analyses and waiting for availability of novel sequencing data.

A second project deals with the characterization of mutations in *Dictyostelium discoideum* linked to autophagy and human rare diseases. Data comes from whole-genome-sequencing (WGS) of wild-type and mutant strains.

Other lines of work deal with antibiotic resistance in collaboration with different experimental groups. On one hand, we are exploring associations between certain resistances and chromosomal rearrangements in bacteria using pangenomics, and on the other hand, the evolutionary and metabolic mechanisms that allow some bacterial species to develop antibiotic resistance.

A different line of work deals with coronaviruses (since 2016). We have analyzed diverse viral proteins and run drug screenings for potentially useful drugs to treat the infection. This work is currently on hold pending additional experimental development.

Other projects may come up before or during the stay of the students.

Requisitos (Prerequisites): *(indicar titulación y curso) (give Grade and academic year); otros requisitos adicionales (idiomas, informática, otros conocimientos, etc) (other additional prerequisites (languages, informatics, other knowledge, etc)*

Degree or Master student in areas of Life and Health Sciences, Bioinformatics, Computational Biology or Informatics/Computer Science.

English.

Tasks will be adapted to the training and interests of the student.

Proyecto formativo (Training Project)



Module EXTERNAL PRACTICES. The fundamental goal of the practices is to guide the student in applying his knowledge to real tasks in a real-life mixed (computational and wet-lab) work environment. The tasks will offer not only experience in analysis of data and software development (typical of large enterprise groups), but also in the direct interaction with end users, collecting data, specifications, understanding problems, issuing solutions and presenting them to end users in a user-centered way. Students are recommended to attend courses organized locally (typically one or two one-week courses at least) during their stay. Students will learn to work using Linux and high-performance computing environments.

Module TFG/TFM. The student will be assigned a main task according to their interests from among the various tasks being addressed in the Service. They will be responsible for understanding the problem, collecting all required information and trying, choosing and implementing the best solution approach, all with discussion, guidance and advice from local experts.

Actividades a desarrollar en la práctica académica (Activities that will be performed in the academic internship):

During their stay, students will have a chance to learn and use the scientific software tools required to develop their work in environments with Linux and High Performance Computing.

We will offer courses (non-compulsory, but highly recommended if the student is not fluent in these topics) on Biosecurity, Biostatistics and R Programming. We are preparing courses on Artificial Intelligence and on Python.

To do their work, students must communicate and interact with scientific staff from experimental laboratories, as well as complement the information they receive with additional scientific data extracted from the scientific literature in English. They must make presentations to communicate the results obtained, their interpretation and to make suggestions for future development of subsequent experimental and analytic work.

The student will learn to write and elaborate reports of their work and to organize them for a final report (such as their Grade or Master Thesis).

They may be able to collaborate (if the initiative is restarted and there are applications) in dissemination and training activities, 4ºESO+Empresa and/or online seminars for secondary education institutions, and possibly ERASMUS+ students.

Nº de plazas:

1-2



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(Nr. of places)	
¿El alumno tendrá trato habitual con menores? (Has the student dealings with underage persons?)	Not habitually, may interact with ESO/Bachelor students for approximately one week.
Fecha de inicio: (Starting date)	
Fecha de fin: (End date)	
Horas semanales: (Weekly hours)	
Horario jornada laboral: (Working hours)	Standard schedules, flexible between 08:00 and 17:00
Importe Ayuda/Bolsa de estudio: (Amount of fellowship / remuneration)	0 €/mes
Tutor académico: (Academic tutor (UPM)) Email:	
Departamento tutor académico:	



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(Dept. of academic tutor)	
Tutor empresa: (External tutor)	José Ramón Valverde Carrillo
Email tutor empresa: (Email external tutor)	jrvalverde@cnb.csic.es
Departamento tutor empresa: (Dept. of external tutor)	Informática Científica
Ubicación de la estancia de las prácticas (Location of the internship)	CNB-CSIC. c/Darwin, 3. Campus UAM. Madrid.
ENTIDAD COLABORADORA: (Collaborating Entity)	CNB-CSIC
A cumplimentar por Oficina Prácticas ETSIAAB: Créditos a reconocer (Nº ECTS):	

Enviar por email a: **OFICINA DE PRÁCTICAS ACADEMICAS EXTERNAS – ETSIAAB**